Space Weather Forecast

Issued on Monday, 12 June 2023 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate X-ray flares (R1-R2 radio blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only common class flares observed. The six sunspot regions on the visible disc have generally been declining with all regions small and relatively simple, and no significant growth currently occurring. No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours, however a large filament eruption was observed from the northern polar area of the Sun and there are other filaments on the Earth-facing Sun that will be monitored for any eruption. These are lines of material held together by the Sun's magnetic field that can be released in the form of CMEs.

Solar Wind / Geomagnetic Activity: The solar wind showed an ongoing fast wind environment from a coronal hole. Solar wind speeds were slightly elevated at 400-470km/s. The magnetic field strength decreased from Moderate to be weak from around 11/2030 UTC. The north-south component was initially variable between moderate negative (southward) and weakly positive (northward) values, but became predominately weakly positive (northward) from 11/2030 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with a chance of rising to Moderate with isolated Moderate flares possible.

Solar Wind / Geomagnetic Activity: A CME associated with the Moderate flare on 09 Jun is directed mainly behind Earth but has the potential to give a glancing influence, most likely on day 2 (13 Jun). There are no other Earth-directed CMEs. Ongoing slightly elevated solar winds are expected days 1-2 (12-13 Jun) as the coronal hole fast winds persist, before easing day 3 (14 Jun). The next enhancement is expected to be from the arrival of further fast winds from another coronal hole during day 4 (15 Jun). Mainly Quiet geomagnetic conditions are expected with Unsettled spells. There is a slight chance of Active to G1 Minor Storm intervals, mainly late day 1 or day 2 (12 or 13 June) due to CME glance or on day 4 (15 June).

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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